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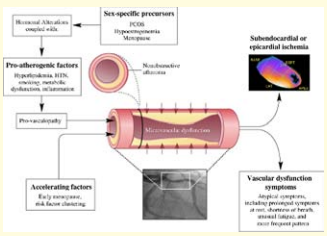
Inside This Issue

STATE-OF-THE-ART PAPER



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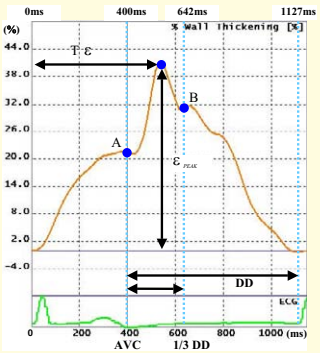
CLINICAL RESEARCH



CORONARY ARTERY DISEASE

Strain Imaging Detects Prolonged Impairment of Diastolic Function After Transient Ischemia **1589**

Katsuhisa Ishii, Tamaki Suyama, Makoto Imai, Motoyoshi Maenaka, Asuka Yamanaka, Yasunaka Makino, Yutaka Seino, Kenei Shimada, Junichi Yoshikawa

Ishii and colleagues studied whether strain imaging (SI), which measures the extent of regional myocardial shortening and lengthening, could detect ischemia-induced alterations in diastolic and systolic function. Regional left ventricular transverse peak strain and strain changes during the first one-third of diastole (strain imaging diastolic index [SI-DI]) were measured in "at-risk" segments after temporary balloon occlusion in 30 patients undergoing percutaneous coronary intervention. Coronary occlusion induced a marked regional reduction in both systolic strain and SI-DI. Upon reperfusion, systolic strain parameters returned to pre-occlusion values quickly. However, SI-DI remained depressed for up to 24 h after reperfusion. SI analysis provides detailed mechanical characterization of regions with myocardial insult and can demonstrate post-ischemic diastolic stunning despite complete systolic functional recovery.

BIOMARKERS AND CARDIAC SURGERY

BNP Level May Improve Pre-Operative Risk Assessment CME **1599**

Ganesan Karthikeyan, Ross A. Moncur, Oren Levine, Diane Heels-Ansdell, Matthew T. V. Chan, Pablo Alonso-Coello, Salim Yusuf, Daniel Sessler, Juan Carlos Villar, Otavio Berwanger, Matthew McQueen, Anna Mathew, Stephen Hill, Simon Gibson, Colin Berry, Huei-Ming Yeh, P. J. Devereaux

Karthikeyan and colleagues conducted a systematic review and meta-analysis to determine if pre-operatively measuring brain natriuretic peptide (BNP) (or N-terminal proBNP) independently predicts 30-day adverse cardiovascular outcomes after noncardiac surgery. Nine studies met eligibility criteria and included over 3,000 subjects and over 300 perioperative cardiovascular complications. The average proportion of patients with elevated BNP was 25, but the threshold for elevation varied in the different studies. All studies showed a statistically significant association between an elevated pre-operative BNP and various cardiovascular outcomes (e.g., a composite of cardiac death and nonfatal myocardial infarction, atrial fibrillation). These results suggest that physicians can use a pre-operative BNP measurement to substantially improve their perioperative cardiovascular risk predictions, but more research is required to determine appropriate thresholds in various patient categories.

Editorial Comment: Daniel Bolliger, Manfred D. Seeberger, Miodrag Filipovic, p. 1607

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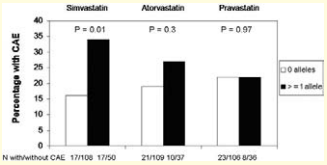
GENETICS AND STATIN EFFECTS



Genetic Variant Associated With Risk of Statin-Induced Myalgias **1609**

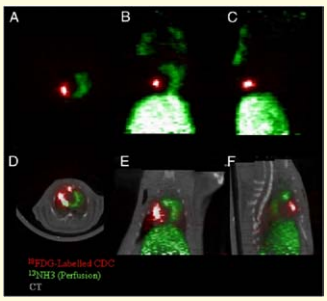
Deepak Voora, Svati H. Shah, Ivan Spasojevic, Shazia Ali, Carol R. Reed, Benjamin A. Salisbury, Geoffrey S. Ginsburg

Voora and colleagues sought to identify single nucleotide polymorphisms (SNPs) that are associated with mild statin-induced side effects such as myalgias. Subjects in the STRENGTH (Statin Response Examined by Genetic Haplotype Markers) study were randomized to both low and high doses of various statins. The primary end point was a composite adverse event (CAE), defined as discontinuation for any side effect, myalgia, or creatine kinase >3× baseline. SNPs associated with reduced function in 5 genes of the cytochrome P450 system were identified. CAEs occurred in 20% of subjects and were more prevalent in women and in carriers of the *SLCO1B1*5* variant. There was evidence for a gene-dose effect with *SLCO1B1*5*, further confirming this finding. This variant allele has previously been found to interfere with localization of the hepatic drug transporter to the plasma membrane, and these data associate this SNP with even mild adverse effects induced by statin therapy.

Editorial Comment: Joseph S. Rossi, Howard L. McLeod, p. 1617

PRE-CLINICAL RESEARCH

PRE-CLINICAL RESEARCH



PET Imaging Can Quantify Efficacy of Cardiac Stem Cell Transplantation **1619**

John Terrovitis, Riikka Lautamäki, Michael Bonios, James Fox, James M. Engles, Jianhua Yu, Michelle K. Leppo, Martin G. Pomper, Richard L. Wahl, Jurgen Seidel, Benjamin M. Tsui, Frank M. Bengel, M. Roselle Abraham, Eduardo Marbán

Terrovitis and colleagues describe their use of positron emission tomography (PET) to quantify retention of cardiac-derived stem cells (CDCs) and to evaluate different delivery methods. CDCs derived from male rats were labeled with [18F]-fluoro-deoxy-glucose (^{18}FDG) and injected into the ischemic region of female rats following permanent left coronary artery ligation. ^{18}FDG PET imaging was then compared with quantitative polymerase chain reaction (PCR) for the male-specific *SRY* gene. Baseline myocardial retention of cells 1 h after delivery was 18% by PCR and 18% by PET. The efficacy of various interventions was also measured: 76% if given immediately after coronary occlusion, 35% when given with adenosine to slow the heart rate, and 37% when fibrin glue was used to hold the cells in place. In vivo PET imaging permits accurate measurement of CDC retention and will allow for comparison of techniques to improve engraftment in beating hearts.

Editorial Comment: Gary S. Feigenbaum, Louis Lemberg, Joshua M. Hare, p. 1627